

320a. Electromagnetic Theory. Every other spring. Spring 2010. THE DEPARTMENT.

First the Maxwell relations are presented as a natural extension of basic experimental laws; then emphasis is given to the radiation and transmission of electromagnetic waves.

Prerequisite: **Physics 223** and **300**, or permission of the instructor.

357a. The Physics of Climate. Every other spring. Spring 2009. MARK BATTLE.

A rigorous treatment of the earth's climate, based on physical principles. Topics include climate feedbacks, sensitivity to perturbations, and the connections between climate and radiative transfer, atmospheric composition, and large-scale circulation of the oceans and atmospheres. Anthropogenic climate change will also be studied. (Same as **Environmental Studies 357** and **Geology 357**.)

Prerequisite: **Physics 229, 255, 256, or 300**, or permission of the instructor.

370a. Advanced Mechanics. Every other spring. Spring 2009. THE DEPARTMENT.

A thorough review of particle dynamics, followed by the development of Lagrange's and Hamilton's equations and their applications to rigid body motion and the oscillations of coupled systems.

Prerequisite: **Physics 300** or permission of the instructor.

401a–404a. Advanced Independent Study in Physics. THE DEPARTMENT.

Topics to be arranged by the student and the faculty. Students doing advanced independent study normally have completed a 300-level physics course.

451a–452a. Honors in Physics. THE DEPARTMENT.

Programs of study are available in semiconductor physics, microfabrication, superconductivity and superfluidity, astrophysics, relativity, ultrasound, and atmospheric physics. Work done in these topics normally serves as the basis for an honors paper.

Prerequisite: Permission of the instructor.

Psychology

Professors: Barbara S. Held†, Louisa M. Slowiaczek

Associate Professors: Suzanne Lovett†, Samuel P. Putnam, *Chair*; Paul Schaffner

Joint Appointments with Neuroscience: Associate Professor Richmond R. Thompson,

Assistant Professor Seth J. Ramus

Visiting Assistant Professors: Rachel W. Kallen, Julie Quimby

Senior Department Coordinator: Donna M. Trout

Students in the Department of Psychology may elect a major within the psychology program, or they may elect an interdisciplinary major in neuroscience, sponsored jointly by the Departments of Psychology and Biology (see Neuroscience, pages 228–29). The program in psychology examines contemporary perspectives on principles of human behavior, in areas ranging from cognition, language, development, and behavioral neuroscience to interpersonal relations and psychopathology. Its approach emphasizes scientific methods of inquiry and analysis.

Requirements for the Major in Psychology

The psychology major comprises ten courses. These courses are selected by students with their advisors and are subject to departmental review. Each student must take three core courses: an introductory course, **Psychology 10** or **101**, which will serve as a prerequisite to further study in the major; and **Psychology 251** and **252**. These core courses should be completed before the junior year. Students must take three electives numbered **200** or above. Finally, students must take laboratory and advanced courses. Students have the option of taking either (a) two laboratory courses numbered **260–279** and two advanced (300-level) courses, or (b) three laboratory courses numbered **260–279** and one advanced (300-level) course. Note that either **Psychology 10** or **101**, but not both, may count toward the major requirement. In addition, either **Psychology 275** or **276**, but not both, may count toward the two- or three-course laboratory-requirement options. Similarly, either **Psychology 320** or **321**, but not both, may count toward the two-advanced-course-requirement option; and no more than one course from among **Psychology 315, 316, 318, and 319** may count toward the two-advanced-course-requirement option. Independent study courses at any level count as electives, but do not count toward the laboratory requirement or the advanced-course requirement. Majors are encouraged to consider an independent study course on a library, laboratory, or field research project during the senior year.

Students who are considering a major in psychology are encouraged to enroll in **Psychology 10** or **101** during their first year at Bowdoin and to enroll in **Psychology 251** and **252** during their second year. Students must take **Psychology 251** before **252**, and both before they take their laboratory courses, except for those labs (**274, 275, 276, and 277**) that allow concurrent enrollment in **252** and **260**, which does not require **252**. If possible, students should begin their laboratory work no later than the fall of their junior year. Only juniors and seniors are allowed to enroll in the advanced courses. Those who plan to study away from campus for one or both semesters of their junior year should complete at least one laboratory course before leaving for their off-campus experience and plan their courses so that they can complete the major after returning to campus. Students should speak with the chair of the department regarding their off-campus study plans and transfer of credit toward the major. Laboratory or 300-level courses taken elsewhere are not ordinarily counted toward the major.

Requirements for the Minor in Psychology

The psychology minor comprises six courses, including **Psychology 10** or **101**, **Psychology 251** and **252**, and one laboratory course. Note that either **Psychology 10** or **101**, but not both, may count toward the minor requirement.

Grade Requirements

To fulfill a major (or minor) requirement in psychology, or to serve as a prerequisite for another psychology course, a grade of C- or better must be earned in a course. There is one exception: **Psychology 10** or **101** may be taken on a Credit/D/Fail basis, and it will count toward the major (or minor) and serve as a prerequisite for other psychology courses if Credit (CR) is earned in the course.

AP/IB Policy

Students who receive an AP score of 4 or higher on the psychology exam receive one AP credit and are considered to have met the prerequisite for courses requiring **Psychology 10** or **101**. This credit also counts toward the major or minor. Students who receive an IB score (higher level) of 5 or higher on the psychology exam receive one IB credit and are

considered to have met the prerequisite for courses requiring **Psychology 10** or **101**. This credit also counts toward the major or minor. No AP or IB credit for psychology is awarded if a student takes **Psychology 10** or **101**. Students do not receive duplicate credit for AP and IB exams in psychology.

Requirements for the Major in Neuroscience

See Neuroscience, pages 228–29.

COURSES IN PSYCHOLOGY

First-Year Seminars

For a full description of first-year seminars, see pages 147–57.

10b. What's on Your Mind? An Introduction to the Brain and Behavior. Every fall. SETH J. RAMUS.

Introductory Courses

101b. Introduction to Psychology. Every semester. THE DEPARTMENT.

A general introduction to the major concerns of contemporary psychology, including physiological psychology, perception, learning, cognition, language, development, personality, intelligence, and abnormal and social behavior. Recommended for first- and second-year students. Juniors and seniors should enroll in the spring semester.

Intermediate Courses

210b. Infant and Child Development. Every fall. SAMUEL P. PUTNAM. Spring 2010. SUZANNE LOVETT.

A survey of major changes in psychological functioning from conception through childhood. Several theoretical perspectives are used to consider how physical, personality, social, and cognitive changes jointly influence the developing child's interactions with the environment.

Prerequisite: **Psychology 10** or **101**.

211b. Personality. Every fall. JULIE QUIMBY.

A comparative survey of theoretical and empirical attempts to explain personality and its development. The relationships of psychoanalytic, interpersonal, humanistic, and behavioral approaches to current research are considered.

Prerequisite: **Psychology 10** or **101**.

212b. Social Psychology. Every spring. PAUL SCHAFFNER.

A survey of theory and research on individual social behavior. Topics include self-concept, social cognition, affect, attitudes, social influence, interpersonal relationships, and cultural variations in social behavior.

Prerequisite: **Psychology 10** or **101**, or **Sociology 101**.

[213b. Atypical Child Development.]

[215b. Adolescent Development.]

216b. Cognitive Psychology. Every fall. LOUISA M. SLOWIACZEK.

A survey of theory and research examining how humans perceive, process, store, and use information. Topics include visual perception, attention, memory, language processing, decision making, and cognitive development.

Prerequisite: **Psychology 10** or **101**.

217a. Neuropsychology. Every other spring. Spring 2009. SETH J. RAMUS.

An introduction to the brain basis of behavior, concentrating on the contributions from studies of brain damaged and brain dysfunctional patients. Focuses on the contributions of neurology and experimental and clinical neuropsychology to the understanding of normal cognitive processes. Topics include neuroanatomy, amnesia, aphasia, agnosia, and attentional disorders, in particular those implicated in various spatial neglect syndromes.

Prerequisite: **Psychology 10** or **101**.

218a. Physiological Psychology. Every spring. RICHMOND R. THOMPSON.

An introductory survey of biological influences on behavior. The primary emphasis is on the physiological regulation of behavior in humans and other vertebrate animals, focusing on genetic, developmental, hormonal, and neuronal mechanisms. Additionally, the evolution of these regulatory systems is considered. Topics discussed include perception, cognition, sleep, eating, sexual and aggressive behaviors, and mental disorders.

Prerequisite: **Psychology 10** or **101**, or one of the following: **Biology 102, 104, 105**, or **109**.

219b. Cultural Psychology. Spring 2009. RACHEL W. KALLEN.

An examination of current theories and research on the psychology of culture. Examines the way in which sociocultural context influences and is influenced by psychological processes such as self, agency, motivation, emotion, cognition, and relationships. Includes important discussion of methodological and theoretical issues, as well as current empirical evidence for cultural variation in psychological processes. Special topics such as culture and development, psychopathology, race and ethnicity, acculturation, cognition, and gender are discussed.

Prerequisite: **Psychology 10** or **101**.

251b. Research Design in Psychology. Every fall. PAUL SCHAFFNER. Every spring. LOUISA M. SLOWIACZEK.

A systematic study of the scientific method as it underlies psychological research. Topics include prominent methods used in studying human and animal behavior, the logic of causal analysis, experimental and non-experimental designs, issues in internal and external validity, pragmatics of careful research, and technical writing of research reports.

Prerequisite: **Psychology 10** or **101**.

252a - MCSR. Data Analysis. Every fall. RACHEL W. KALLEN. Every spring. SETH J. RAMUS.

An introduction to the use of descriptive and inferential statistics and design in behavioral research. Weekly laboratory work in computerized data analysis. Required of majors no later than the junior year, and preferably by the sophomore year.

Prerequisite: **Psychology 10** or **101**, and one of the following: **Psychology 251, Biology 102, 104, 105**, or **109**.

Courses that Satisfy the Laboratory Requirement (except 259)

259b, 260b. Abnormal Psychology. Every spring. JULIE QUIMBY.

A general survey of the nature, etiology, diagnosis, and treatment of common patterns of mental disorders. The course may be taken for one of two purposes:

259b. Non-laboratory course credit. Participation in the practicum is optional, contingent upon openings in the program.

Prerequisite: **Psychology 211.**

260b. Laboratory course credit. Students participate in a supervised practicum at a local psychiatric unit.

Prerequisite: **Psychology 211 and 251.**

270b. Laboratory in Cognition. Every fall. LOUISA M. SLOWIACZEK.

An analysis of research methodology and experimental investigations in cognition, including such topics as auditory and sensory memory, visual perception, attention and automaticity, retrieval from working memory, implicit and explicit memory, metamemory, concept formation and reasoning. Weekly laboratory sessions allow students to collect and analyze data in a number of different areas of cognitive psychology.

Prerequisite: **Psychology 216, 251, and 252.**

274b. Laboratory in Group Dynamics. Every fall. PAUL SCHAFFNER.

Principles and methods of psychological research, as developed in **Psychology 251 and 252**, are applied to the study of small group interaction. Students design, conduct, and report on social behavior research involving an array of methods to shape and assess interpersonal behavior.

Prerequisite: **Psychology 211, 212, or 219; Psychology 251;** and previous credit or concurrent registration in **Psychology 252.**

275a - INS. Laboratory in Behavioral Neuroscience: Social Behavior. Every spring. RICHMOND R. THOMPSON.

A laboratory course that exposes students to modern techniques in neuroscience that can be applied to the study of social behavior. Underlying concepts associated with various molecular, neuroanatomical, pharmacological, and electrophysiological methods are discussed in a lecture format. Students then use these techniques in laboratory preparations that demonstrate how social behavior is organized within the central nervous system of vertebrate animals, including humans.

Prerequisite: **Psychology 218 or Biology 213;** one of the following: **Psychology 251, Biology 102, 104, 105, or 109;** and previous credit or concurrent registration in **Psychology 252.**

276a - INS. Laboratory in Behavioral Neuroscience: Learning and Memory. Every fall. SETH J. RAMUS.

Explores current research and theories in the neurobiology of learning and memory by examining the modular organization of the brain with an emphasis on a brain systems-level approach to learning and memory, using both lectures and laboratory work. Memory is not a unitary phenomenon, rather, different parts of the brain are specialized for storing and expressing different kinds of memory. In addition to discussing contemporary research, students use modern neuroscientific methods in the laboratory to demonstrate how different memory systems can be dissociated. Techniques include behavioral, neurosurgical, and histological analysis in vertebrate species.

Prerequisite: **Psychology 218 or Biology 213;** one of the following: **Psychology 251, Biology 102, 104, 105, or 109;** and previous credit or concurrent registration in **Psychology 252.**

277b. Research in Developmental Psychology. Every spring. SAMUEL P. PUTNAM.

The multiple methods used in developmental research are examined both by reading research reports and by designing and conducting original research studies. The methods include observation, interviews, questionnaires, lab experiments, among others. Students learn to evaluate the relative strengths and weaknesses of both qualitative and quantitative approaches.

Prerequisite: **Psychology 210, 213, or 215; Psychology 251;** and previous credit or concurrent registration in **Psychology 252.**

Advanced Courses**307b. Theories of Counseling and Psychotherapy.** Fall 2008. JULIE QUIMBY.

Theories of counseling and psychotherapy, with an emphasis on the major models within the field, will be critically evaluated, contrasted, and applied to a range of psychological problems and diverse populations. Explorations of the historical background and developmental precipitants of each theory as well as the multicultural strengths and weaknesses of each counseling approach.

Prerequisite: One of the following: **Psychology 213, 259, or 260;** or **Philosophy 210, 226, 227, 237, or 399;** or permission of the instructor.

309b. Psychotherapy, Psychology, and Philosophy. Fall 2009. BARBARA S. HELD.

As conventional assumptions about the discipline of psychology are increasingly challenged, many psychologists are returning to psychology's roots in philosophy for guidance. Examines the intersection of philosophy and psychology in general, and clinical psychology in particular. Topics include such ontological issues as the nature of personhood, the self, mental health/psychopathology, agency, free will vs. determinism, and change/transformation. Also examines such epistemological issues as the nature of psychological knowledge/truth, self-knowledge, rationality, justification for knowledge claims, and methods for obtaining justified knowledge claims. Emphasizes current debates about what a proper science or study of (clinical) psychology and psychotherapy should be.

Prerequisite: One of the following: **Psychology 213, 259, or 260;** or **Philosophy 210, 226, 227, 237, or 399;** or permission of the instructor.

315a. Hormones and Behavior. Every other fall. Fall 2008. RICHMOND R. THOMPSON.

An advanced discussion of concepts in behavioral neuroendocrinology. Topics include descriptions of the major classes of hormones, their roles in the regulation of development and adult behavioral expression, and the cellular and molecular mechanisms responsible for their behavioral effects. Hormonal influences on reproductive, aggressive, and parental behaviors, as well as on cognitive processes are considered.

Prerequisite: **Psychology 218 or Biology 213;** one of the following: **Psychology 251, Biology 102, 104, 105, or 109;** and **Psychology 252.**

316a. Comparative Neuroanatomy. Every other fall. Fall 2009. RICHMOND R. THOMPSON.

An advanced discussion of concepts in vertebrate brain organization. The primary emphasis is upon structure/function relationships within the brain, particularly as they relate to behavior. Topics include basic neuroanatomy, brain development and evolution, and the neural circuitry associated with complex behavioral organization. Studies from a variety of animal models and from human neuropsychological assessments are used to demonstrate general principles of brain evolution and function.

Prerequisite: **Psychology 218 or Biology 213;** one of the following: **Psychology 251, Biology 102, 104, 105, or 109;** and **Psychology 252.**

317b. The Psychology of Language. Every spring. LOUISA M. SLOWIACZEK.

An examination of psychological factors that affect the processing of language, including a discussion of different modalities (auditory and visual language) and levels of information (sounds, letters, words, sentences, and text/discourse). Emphasis is on the issues addressed by researchers and the theories developed to account for our language abilities.

Prerequisite: **Psychology 216, 251, and 252.**

319a. Memory and Brain. Every other spring. Spring 2010. SETH J. RAMUS.

Advanced seminar exploring the biological basis of learning and memory from a cellular to a systems-level analysis, providing insights into the mechanisms and organization of neural plasticity. Includes topics in molecular neuroscience, neurophysiology, neuropharmacology, and systems neuroscience. Discussions include evaluation of current research and theories, as well as a historical perspective.

Prerequisite: **Psychology 218 or Biology 213**; one of the following: **Psychology 251, Biology 102, 104, 105, or 109**; and **Psychology 252.**

320b. Social Development. Every fall. SAMUEL P. PUTNAM.

Research and theory regarding the interacting influences of biology and the environment as they are related to social and emotional development during infancy, childhood, and adolescence. Normative and idiographic development in a number of domains, including morality, aggression, personality, sex roles, peer interaction, and familial relationships are considered.

Prerequisite: **Psychology 210, 213, or 215, and Psychology 251 and 252.**

321b. Cognitive Development. Spring 2010. SUZANNE LOVETT.

Examines the development of cognitive understanding and cognitive processes from infancy through adolescence. Emphasis on empirical research and related theories of cognitive development. Topics include infant perception and cognition, concept formation, language development, theory of mind, memory, problem solving, and scientific thinking.

Prerequisite: **Psychology 210, 213, or 215, and Psychology 251 and 252.**

325b. Organizational Behavior. Every spring. PAUL SCHAFFNER.

Examines how people experience work in modern human organizations. Weekly seminar meetings address motivation, performance, commitment, and satisfaction; affect and cognition at work; coordination of activity; anticipation, planning, and decision making; organization-environment dynamics; and the enactment of change.

Prerequisite: **Psychology 251 and 252.**

326b. The Psychology of Stigma. Spring 2009. RACHEL W. KALLEN.

A critical examination of classic and contemporary theories and research on stigma. Emphasis will be on the psychological experiences of members of stigmatized groups; why individuals stigmatize others; sensitivity to discrimination; collective identity; methods of coping; and implications for the self, social interaction, and intergroup relations. Topics include race, ethnicity, gender, mental illness, sexuality, HIV/AIDS, and health/physical disabilities. (Same as **Gay and Lesbian Studies 326** and **Gender and Women's Studies 325.**)

Prerequisite: **Psychology 212, 251, and 252.**

Independent Study and Honors

291b–294b. Intermediate Independent Study in Psychology.

401b–404b. Advanced Independent Study and Honors in Psychology.